

CLAIMS

What is claimed is:

1. A system for managing the shipment of hazardous material goods, comprising:
- a storage device for storing data related to the shipment;
 - a processor for retrieving in near real-time and updating at least one data set in the storage module; and
 - an analysis module for analyzing the data and providing the results of the analysis to a user.
2. The system of Claim 1 wherein the data is selected from the group of shipment data, geographic positioning data, weather data, emergency conditions data, emergency response data, geospatial data and combinations thereof.
3. The system of Claim 1 wherein the analysis module provides information selected from the group consisting of an optimal shipment route, an emergency condition determination, an emergency response, and as applicable, a projected plume dispersion.
4. The system of Claim 3 wherein the projected plume dispersion is related to the emergency condition determination, the dispersion being calculated based on shipment data, geographic positioning data, geospatial data and near real-time weather data specific to the emergency condition and physical location.

5. The system of claim 1 wherein the analysis module identifies a proposed route calculated based on risk analysis that consists of an impedance type model which summarizes "resistance" of a route and which selects the lowest "resistance" path.

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6. The system of Claim 5 wherein data on the route and along all possible alternative routes includes population density and distribution, political boundaries, environmental boundaries, surface inclination and topology, road surface type, road dimensions, road height and weight limitations, road authorizations for cargo types, and road segment distances.

7. The system of Claim 1 further comprising:

- a network for relaying shipment data, geographical positioning data and near real-time weather data; and
- an emergency assessment module for projecting potential emergency conditions as a function of the data;

wherein information about the projected emergency conditions is transmitted over the network and is available for access at remote locations.

8. The system of Claim 1 further comprising:

- a notification module for automatically transmitting the results of the analysis to remote locations via a network.

9. The system of Claim 1 further comprising:

a sensor for monitoring the shipment and transmitting information to the processor in the event of an emergency condition.

10. A method for managing a shipment of hazardous material goods, comprising:

obtaining shipment data containing information about the goods;

determining optimal and alternate routes for transport of the goods;

obtaining geographic positioning data about the location of the goods as they travel from a starting location to a distribution location;

using the geographic positioning data to select weather data related to the location of the goods;

monitoring the shipment with regard to transport progress and to detect an emergency condition;

calculating a recommended response to a detected emergency condition;

and

automatically notifying database-defined emergency response authorities.

11. The method of Claim 10 wherein the recommended response is a function of the selected weather data, the hazards associated with the goods, the location of the goods and the terrain of the geographic location of the goods.

12. The method of claim 10 wherein determining optimal and alternate routes includes determining a proposed route calculated based on risk analysis that consists of an impedance type model which summarizes "resistance" of a route and which selects the lowest "resistance" path.

13. The method of Claim 12 wherein data on a route and along all possible alternative routes includes population density and distribution, political boundaries, environmental boundaries, surface inclination and topology, road surface type, road dimensions, road height and weight limitations, road authorizations for cargo types, and road segment distances.

14. The method of Claim 10 further including determining a projected plume dispersion related to an emergency condition, wherein the dispersion is calculated based on shipment data, geographic positioning, geospatial data and weather data.

15. The method of Claim 14 wherein the recommended response is based on the projected plume dispersion.

16. The method of Claim 10 further including transmitting information about the presence of the emergency condition to selected users.

17. The method of Claim 16 wherein the information is transmitted over a network.

18. The method of Claim 17 wherein the information includes transmitting details about an incident and the recommended response.

19. The method of Claim 10 wherein weather data is selected from the group consisting of wind speed, wind direction, air temperature, precipitation, percent cloud cover, water flow and combinations thereof.

20. The method of Claim 10 wherein the shipment data is selected from the group consisting of material, amount, toxicity, remediation methods, shipment source location, shipment destination location and combinations thereof.

21. The method of Claim 10 further including using the geographic positioning data to select geospatial data.

22. The method of Claim 21 wherein the geospatial data is selected from the group consisting of road type, surface type, road limitations, speed restrictions, road conditions, traffic speed and density, transport restrictions, inclination and combinations thereof.

23. A method for management of shipment of hazardous materials, said method comprising:

obtaining weather data, shipment data, and geographic positioning data

related to the shipment;

sensing an emergency condition for the hazardous materials during the shipment;

calculating an emergency hazardous condition and extent based on the weather data, shipment data and geographic positioning data; and

wherein the emergency hazardous condition and extent is determined remotely based on the geographical position of the shipment.

24. The method of claim 23 further comprising determining optimal and alternate routes, and determining a proposed route calculated based on risk analysis that consists of an impedance type model which summarizes "resistance" of a route and which selects the lowest "resistance" path.

25. The method of Claim 24 wherein data on a route and along all possible alternative routes includes population density and distribution, political boundaries, environmental boundaries, surface inclination and topology, road surface type, road dimensions, road height and weight limitations, road authorizations for cargo types, and road segment distances.

26. The method of Claim 23 further including transmitting an emergency message based on the emergency hazardous condition and extent.

27. The method of Claim 23 wherein the emergency assessment includes:
determining a projected plume dispersion of the hazardous materials caused by
the emergency condition; and
providing a recommended response based on the plume dispersion of the
hazardous materials.

28. The method of Claim 23 wherein the weather data is selected from the
group consisting of wind speed, wind direction, air temperature, precipitation, percent
cloud coverage and combinations thereof.

29. A management system for shipment of goods, the system comprising:
a network for retrieving shipment data, geographical positioning data and
near real-time weather data; and
an emergency assessment module for projecting emergency conditions
likely to be created in the event of an emergency condition of the goods as a function of
retrieved data and recommended alterations to the route based on these conditions.

30. The system of Claim 29 further comprising:
an optimal route module for determining a best route based on relevant
static and dynamic considerations.

31. The system of claim 30 wherein the route module identifies a proposed
route calculated based on risk analysis that consists of an impedance type model which

summarizes "resistance" of a route and which selects the lowest "resistance" path.

32. The system of Claim 31 wherein data on the route and along all possible alternative routes includes population density and distribution, political boundaries, environmental boundaries, surface inclination and topology, road surface type, road dimensions, road height and weight limitations, road authorizations for cargo types, and road segment distances.

33. The system of Claim 29 further comprising:
a notification module for automatically transmitting an emergency message based on an anticipated plume dispersion.

34. The system of Claim 29 wherein the emergency assessment module calculates an anticipated plume dispersion of the goods.

35. The system of claim 29 wherein the assessment module detects various conditions of the shipment enroute.

36. The system of claim 29 further comprising a sensor for monitoring the shipment, said sensor detecting the emergency condition

37. The system of Claim 29 wherein the emergency assessment module calculates a recommended response to the emergency condition.

38. The system of Claim 29 wherein the emergency assessment module determines a projected plume dispersion related to the emergency condition, the dispersion is calculated based on shipment data, geographic positioning, geospatial data and weather data.

39. The system of Claim 38 wherein prediction of the emergency condition is based on the projected plume dispersion.

40. The system of Claim 39 wherein prediction of the emergency condition is transmitted to users.